

# International IOR Rectifier

## 50SQ... SERIES

### SCHOTTKY RECTIFIER

5 Amp

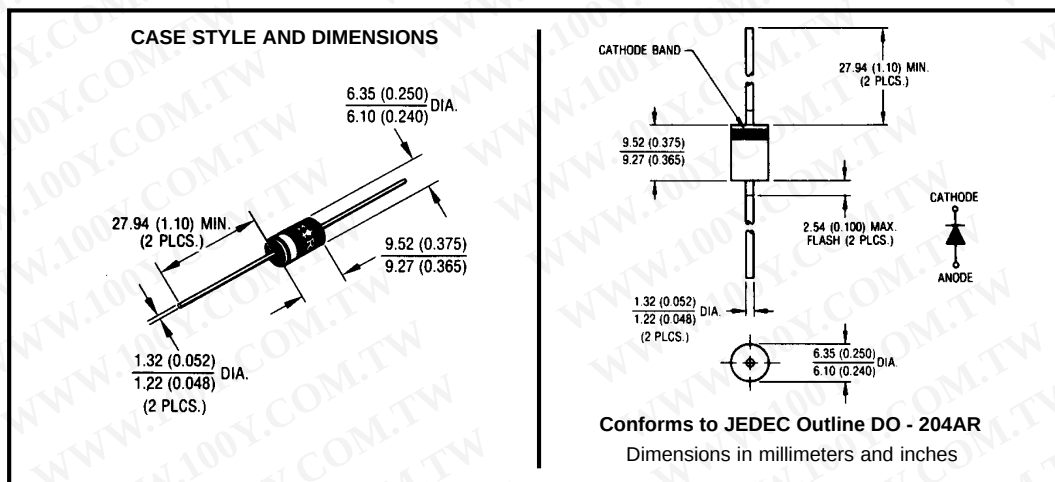
#### Major Ratings and Characteristics

| Characteristics                    | 50SQ...    | Units      |
|------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform   | 5          | A          |
| $V_{RRM}$ range                    | 60 to 100  | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine   | 1900       | A          |
| $V_F$ @ 5 Apk, $T_J = 125^\circ C$ | 0.52       | V          |
| $T_J$ range                        | -55 to 175 | $^\circ C$ |

#### Description/ Features

The 50SQ... axial leaded Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to  $175^\circ C$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ C$   $T_J$  operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## 50SQ... Series

Bulletin PD-2.060 rev. F 03/03

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**IR** Rectifier

### Voltage Ratings

| Part number                                     | 50SQ060 | 50SQ080 | 50SQ100 |
|-------------------------------------------------|---------|---------|---------|
| $V_R$ Max. DC Reverse Voltage (V)               | 60      | 80      | 100     |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |         |         |         |

### Absolute Maximum Ratings

| Parameters                                                              | 50SQ | Units | Conditions                                                                                                               |
|-------------------------------------------------------------------------|------|-------|--------------------------------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward Current<br>* See Fig. 5                | 5    | A     | 50% duty cycle @ $T_C = 119^\circ\text{C}$ , rectangular wave form                                                       |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 1900 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                                                                      |
|                                                                         | 290  |       | 10ms Sine or 6ms Rect. pulse                                                                                             |
| $E_{AS}$ Non-Repetitive Avalanche Energy                                | 7.5  | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 1.0$ Amps, $L = 15$ mH                                                              |
| $I_{AR}$ Repetitive Avalanche Current                                   | 1.0  | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical |

### Electrical Specifications

| Parameters                                                | 50SQ  | Units            | Conditions                                                              |
|-----------------------------------------------------------|-------|------------------|-------------------------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop (1)<br>* See Fig. 1    | 0.66  | V                | @ 5A                                                                    |
|                                                           | 0.77  | V                | @ 10A                                                                   |
|                                                           | 0.52  | V                | @ 5A                                                                    |
|                                                           | 0.62  | V                | @ 10A                                                                   |
| $I_{RM}$ Max. Reverse Leakage Current (1)<br>* See Fig. 2 | 0.55  | mA               | $T_J = 25^\circ\text{C}$                                                |
|                                                           | 7     | mA               | $T_J = 125^\circ\text{C}$                                               |
| $C_T$ Max. Junction Capacitance                           | 500   | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance                           | 10    | nH               | Measured lead to lead 5mm from body                                     |
| $dv/dt$ Max. Voltage Rate of Change<br>(Rated $V_R$ )     | 10000 | V/ $\mu\text{s}$ |                                                                         |

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

### Thermal-Mechanical Specifications

| Parameters                                             | 50SQ       | Units              | Conditions                                        |
|--------------------------------------------------------|------------|--------------------|---------------------------------------------------|
| $T_J$ Max. Junction Temperature Range                  | -55 to 175 | $^\circ\text{C}$   |                                                   |
| $T_{stg}$ Max. Storage Temperature Range               | -55 to 175 | $^\circ\text{C}$   |                                                   |
| $R_{thJL}$ Max. Thermal Resistance Junction to Lead    | 8.0        | $^\circ\text{C/W}$ | DC operation * See Fig. 4<br>1/8 inch lead length |
| $R_{thJA}$ Typical Thermal Resistance, Junction to Air | 44         | $^\circ\text{C/W}$ |                                                   |
| wt Approximate Weight                                  | 1.4(0.049) | g (oz.)            |                                                   |
| Case Style                                             | DO-204AR   | JEDEC              |                                                   |

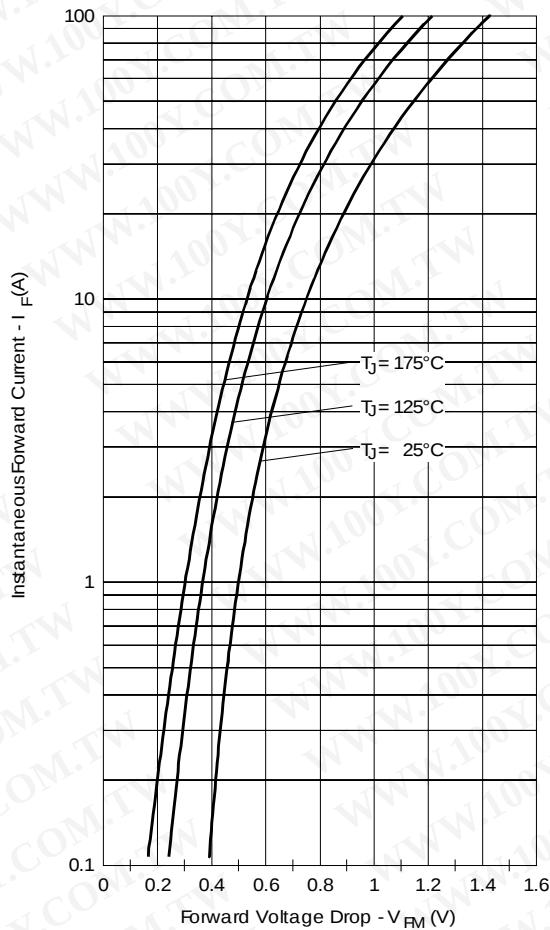


Fig. 1 - Maximum Forward Voltage Drop Characteristics

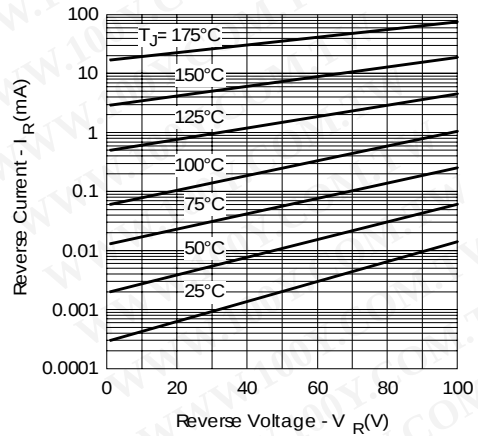


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

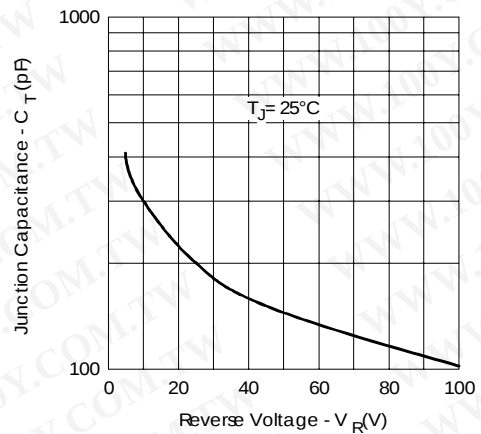


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

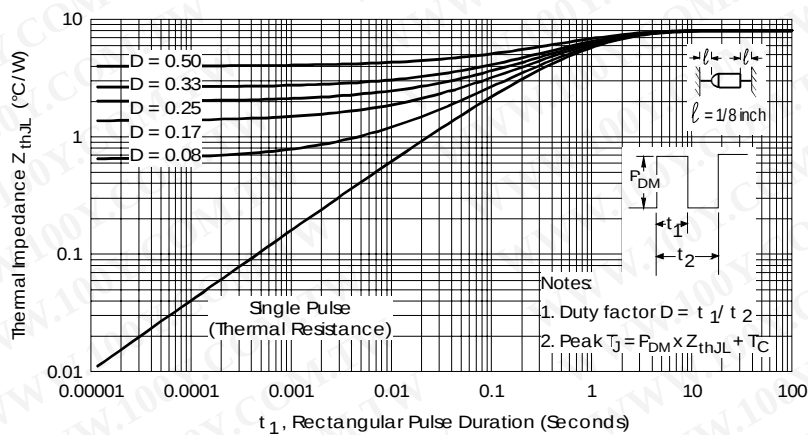


Fig. 4 - Maximum Thermal Impedance  $Z_{thJL}$  Characteristics

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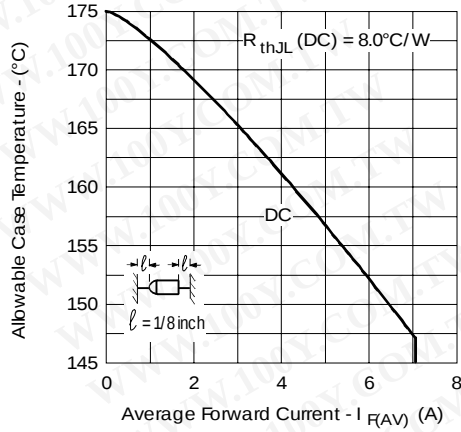


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

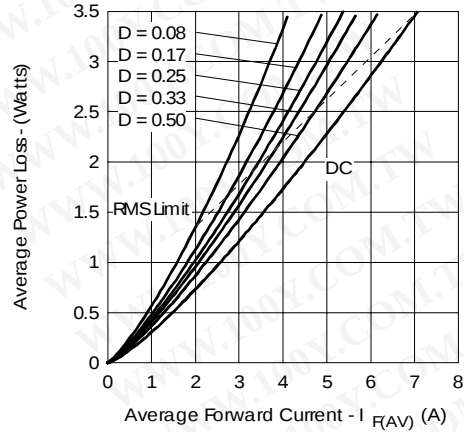


Fig. 6 - Forward Power Loss Characteristics

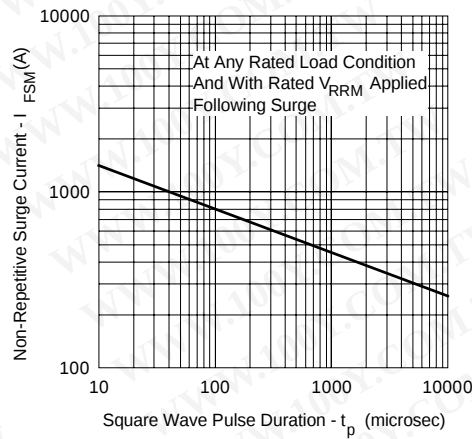


Fig. 7 - Maximum Non-Repetitive Surge Current

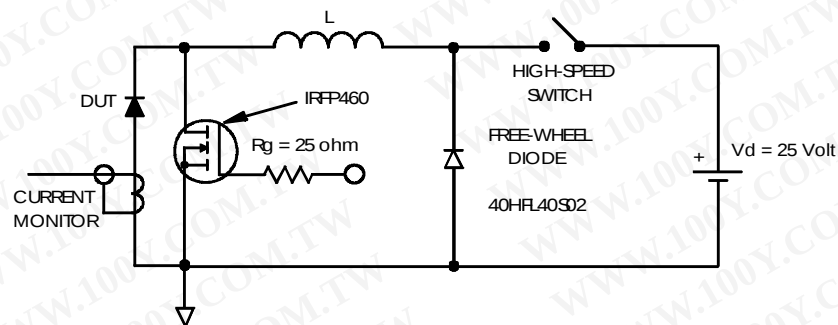


Fig. 8 - Unclamped Inductive Test Circuit

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### Ordering Information Table

| Device Code |   |                                     |     |    |
|-------------|---|-------------------------------------|-----|----|
| 50          | S | Q                                   | 100 | TR |
| ①           | ② | ③                                   | ④   | ⑤  |
| 1           | - | 50 = current x 10                   |     |    |
| 2           | - | S = DO-204AR                        |     |    |
| 3           | - | Q = Schottky Q Series               |     |    |
| 4           | - | Voltage Rating                      |     |    |
| 5           | - | TR = Tape & Reel package (1500 pcs) |     |    |
|             | - | = Box package (200 pcs)             |     |    |

|            |
|------------|
| 060 = 60V  |
| 080 = 80V  |
| 100 = 100V |

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 03/03